SYSTEM FOR MINIMIZING DIRECTORY INFORMATION IN SCALABLE MULTIPROCESSOR SYSTEMS WITH LOGICALLY INDEPENDENT INPUT/OUTPUT NODES

ABSTRACT OF THE DISCLOSURE

A system of scalable shared-memory multiprocessors includes processor nodes and I/O nodes. The I/O nodes connect I/O devices directly to an interconnection network of a system of scalable shared-memory multiprocessors. Each node of the system includes an interface to a local memory subsystem, a memory cache and a protocol engine. The local memory subsystem stores memory lines of information and a directory. Each entry in the directory stores sharing information concerning a memory line of information stored in the local memory subsystem. The protocol engine in each I/O node is configured to limit to a predefined period of time any sharing of a memory line of information from the memory subsystem of any other node. The protocol engine in the home node of the memory line is configured to identify only nodes other than I/O nodes that are sharing the memory line of information. In one embodiment, I/O nodes that share the memory line of information are not identified in the directory entry of the memory line, and instead are represented by a count field, which indicates how many I/O nodes share the memory line of information.